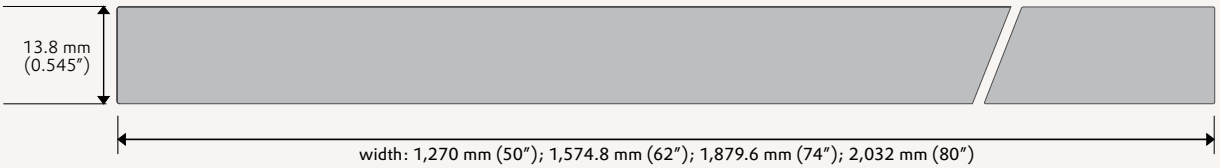
Technical information

ACRYLITE® RinkShield

Physical Properties



Engineered specifically for spectator protection for ice hockey facilites, at .545" thick, ACRYLITE® RinkShield offers a solution that is safer, lighter, stronger, more flexible and easier to maintain than tempered glass, while providing fans with an improved viewing experience. It's also the only product on the market that has been approved for use by both the NHL and the American Society for Testing and Materials. ACRYLITE® RinkShield has been widely used in NHL hockey arenas throughout North America.

ACRYLITE® RinkShield sheet is made to exacting standards. It offers excellent optical characteristics, thickness tolerances, light stability, and low internal stress levels for consistent performance.

Colorless ACRYLITE® RinkShield carries an exclusive 30-year limited warranty on light transmission, your assurance of a quality products.

Characteristics

ACRYLITE® RinkShield is a lightweight, rigid cell cast thermoplastic material that has many times the breakage resistance of standard glass and is highly resistant to weather conditions. It's crisp optical clarity and large uninterrupted viewing surface is thanks to the cell casting manufacturing process. ACRYLITE® RinkShield can be easily sawed, machined, thermoformed, and cemented and is ultraviolet light absorbing up to approximately 360 nanometers.

Because of its unique properties, ACRYLITE® RinkShield is ideal for a wide range of glazing applications in spectator facilities including:

- Ice hockey arenas (indoor/outdoor)
- Soccer arenas (indoor/outdoor)
- Arena football facilities (indoor)
- Lacrosse facilities (indoor/outdoor)

Safety

ACRYLITE® sheet is more impact-resistant than glass. If subjected to impact beyond the limit of its resistance, it does not shatter into small slivers but breaks into comparatively large pieces. ACRYLITE® sheet meets the requirments of ANSI Z 97.1 for use as a Safety Glazing material in Buildings.

Weather Resistance

Acrylic offers better weather resistance than other types of transparent plastics. ACRYLITE® RinkShield will withstand exposure to blazing sun, extreme cold, sudden temperature changes, salt water spray and other harsh

Technical Data (Typical values)

	Light Transmittance D65
Clear (0F00)	92%
U-value	?
R-value	?
Coefficient of Heat Expansion (α)	0.8 mm/m ºC (0.00004 in/in/ºF)
Expansion Due to Heat & Moisture	6 mm/m (1/16″/ft)
Approximate Area Weight	3.3 Kgm^2 (0.7 lbs/ft^2)
Thickness	13.8 mm (.545″)
Width	1,270 mm (50″), 1,574.8 mm (62″), 1,879.6 mm (74″), 2,032 mm (80″)
Length	2,514.6 mm (99″), 3,048 mm (120″)
Maximum Service Temperature	82°C (180 ºF)
ASTM D-635 (Rate of Burn)(3mm)	C2/CC2
ASTM D-1929 (Self Ignition Temp)	910 ºF
ASTM D-2843 (Smoke Density Rating)(3mm)	11.4%
CAN/ULC S102.2	<150
DIN 4102	normal combustability, B2
Forming Temperature	?
Values are approximate.	

conditions. It will not deteriorate after many years of service because of the inherent stability of acrylic ACRYLITE® sheet has been widely accepted for use in skylights, school buildings, industrial plants, aircraft glazing and outdoor signs.

Dimensional Stability

Although ACRYLITE® sheet will expand and contract due to changes in temperature and humidity; it will not shrink with age. Some shrinkage occurs when ACRYLITE® Rinkshield is heated to forming temperature.

Light Weight

ACRYLITE® sheet is half the weight of glass, and 43% the weight of aluminum. One square foot of ACRYLITE® RinkShield weighs 3.35 lbs/sq.ft.

Rigidity

ACRYLITE® sheet is not as rigid as glass or metals. However, it is more rigid than many other plastics such as acetates, polycarbonates, or vinyls. Under load, a sheet will bow and foreshorten as a result of deflection.The depth and width of the glazing channels must be appropriate for the load.

Strength and Stresses

Although the tensile strength of ACRYLITE® RinkShield is 10,000 psi (69 M Pa) at room temperature (ASTM D 638), stress crazing can be caused by continuous loads below this value. For most applications, continuously imposed design loads should not exceed 1,500 psi (10.4 M Pa). Localized, concentrated stresses must be avoided. For this reason, and because of thermal expansion and contraction, large sheets should never be fastened with bolts, but should always be installed in frames.

All thermoplastic materials – including ACRYLITE® RinkShield – will gradually loose tensile strength as the temperature approaches the maximum recommended for continuous service. For ACRYLITE® sheet, the maximum is 180°F (82°C).

Expansion and Contraction

Like most other plastics, ACRYLITE® sheet will expand three times as much as metals, and 8 times as much as glass. The designer should be aware of this rather large coefficient of expansion. A 48" panel will expand and contract approximately .002" for each degree fahrenheit change in temperature. In outdoor use, where summer and winter temperatures differ as much as 100°F, a 48" sheet will expand and contract approximately 3/16". Glazing channels must be of sufficient depth to allow for expansion as well as for contraction.

ACRYLITE® sheet also absorbs water when exposed to high relative humidites, resulting in expansion of the sheet. At relative humidities of 100%, 80%, and 60%, the dimensional changes are 0.6%, 0.4% and 0.2%, respectively.

Heat Resistance

ACRYLITE® RinkShield can be used at temperatures from -40°F (-40°C) up to +180°F (+93°C). It is recommended that temperatures not exceed 180°F for continuous service, or 200°F for short, intermittent use.

Light Transmission

Colourless ACRYLITE® RinkShield has a light transmittance of 92%. It is warranted not to lose more than 3% of its light-transmitting ability in a 30-year period. Contact Evonik Cyro for the complete warranty.

Cutting and Machining

ACRYLITE® sheet can be sawed with circular saws or band saws. It can be drilled, routed, filed and machined much like wood or brass with a slight modification of tools. Cooling of the cutting tool is recommended to keep the machined edge of the sheet as cool and stress free as possible. Heat buildup should be avoided because it could lead to stress crazing. Tool sharpness and "trueness" are also essential to prevent gumming, heat buildup and stresses in the part.

Flammability

ACRYLITE® RinkShield is a combustible thermoplastic. Precautions should be taken to protect the material from flames and high heat sources. ACRYLITE® usually burns rapidly to completion if not extinguished. The products of combustion, if sufficient air is present, are cabon dioxide and water. However, in many fires sufficient air will not be available and toxic carbon monoxide will be formed, as it is from other combustible materials. We urge good judgment in the use of this versatile material and recommend that building codes be followed carefully to ensure it is used properly.

ACRYLITE® RinkShield meets the requirements of the following building codes for use as a Light Trasmitting Plastic:

- NES (See National Evaluation Services Inc., Report #NER-582)
- ICBO (See ICBO Evaluation Services Inc., Evaluation Report #3715-CC2 Classification)
- BOCA and SBCCI (Accept National Evaluation Services Inc., Report # NER-582)

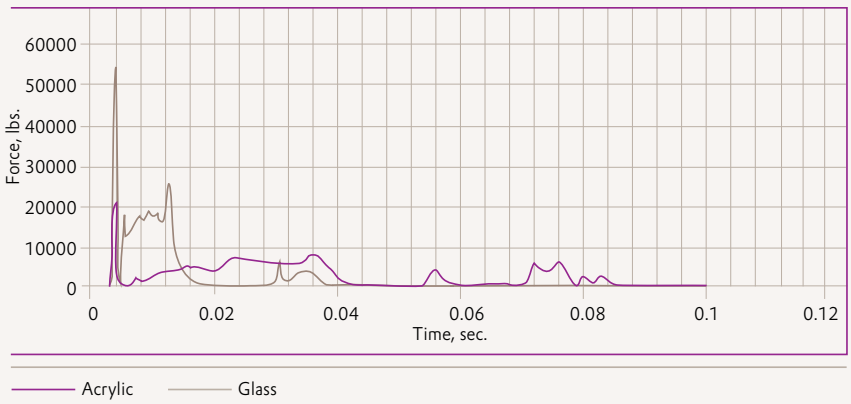
Thermal Conductivity

ACRYLITE® sheet is a better insulator than glass. Its U-Factor or heat transfer value is approximately 10% lower than that of glass of the same thickness. Conversely, its RT-Factor is about 10% greater.

The clear choice... for your players

Computer models generated by Algor, Inc. show that a 200-lb. player skating at 15 mph impacting tempered glass will generate a reaction force of over 54,000 lbs. Under the same conditions, a 200-lb. player impacting acrylic shielding would generate less than 21,000 lbs. of reaction force.

Reaction force on player - acrylic vs. glass shield



May 2013

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